Planning for the Future:

A Reuse Planning Report for the Des Moines TCE Superfund Site Dico Property

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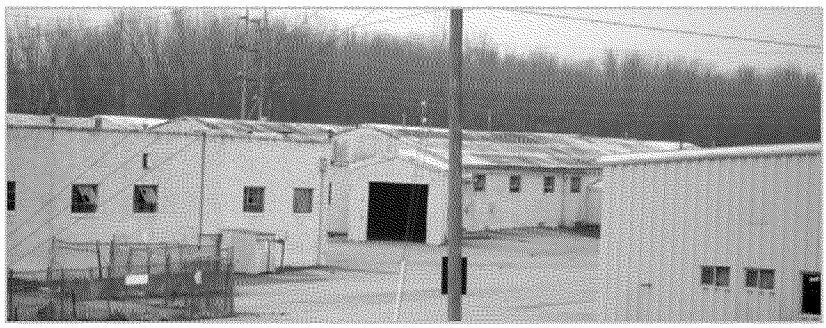
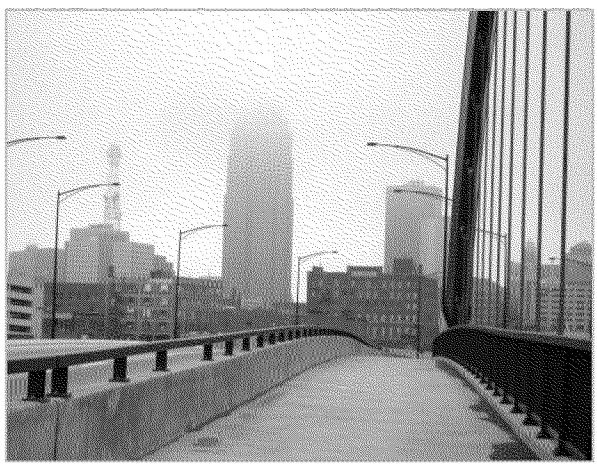




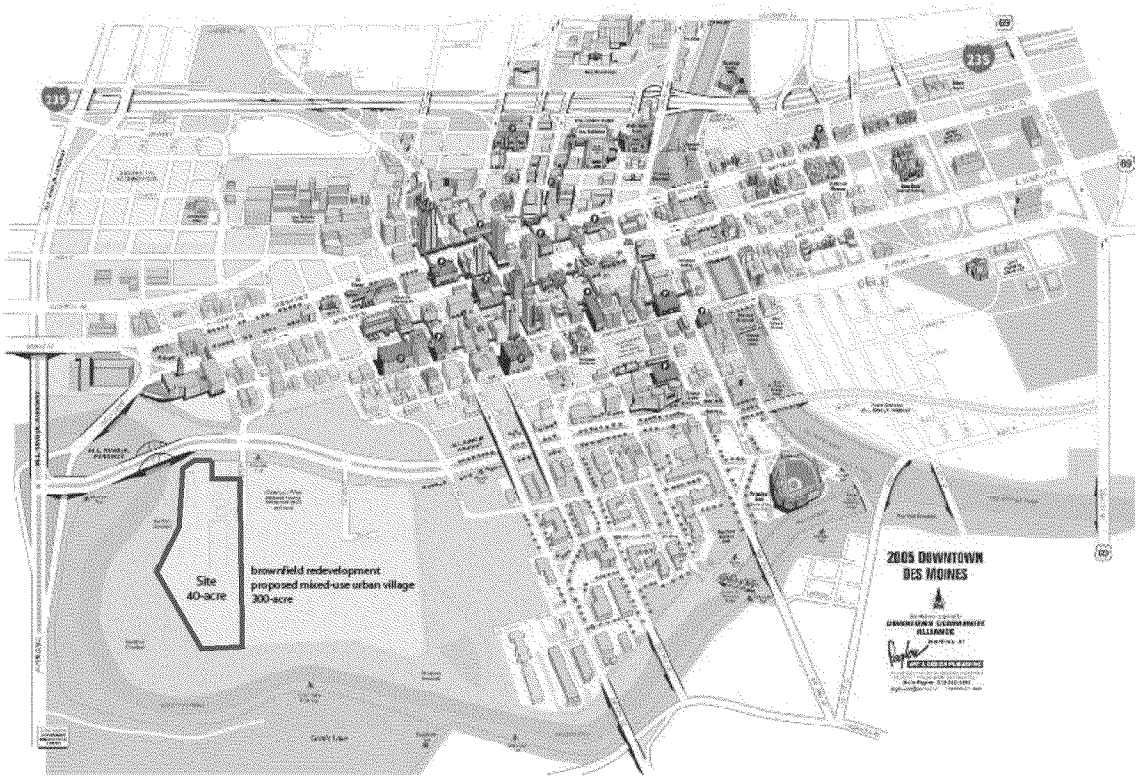
Introduction

Background

Property owned by Dico, Inc. southwest of downtown Des Moines, Iowa, is part of the Des Moines TCE Superfund site. The 40-acre Dico property was home to various manufacturing operations dating back to 1910. It has areas with high levels of groundwater contamination, which threatened the City of Des Moines' public water supply. Soils on the Dico property are contaminated with a wide range of industrial byproducts, including heavy metals, industrial solvents, herbicides, and pesticides. Several buildings on the property contain pesticide residues and polychlorinated biphenyls (PCBs). In 1983, EPA listed the Des Moines TCE site on the National Priorities List (NPL). Beginning in 1986, cleanup actions have been taken to address the contamination and the property has now been remediated to cleanup standards appropriate for continued industrial use.

The City of Des Moines' downtown district is currently experiencing significant regeneration and growth. The properties located to the immediate east of the Dico property are in the early stages of redevelopment. The Dico property sits between these redeveloping Brownfields and the Raccoon River, adjacent to public recreation amenities, and along one of the City's main entrance corridors. In Spring 2006, the City of Des Moines requested information from EPA regarding the potential impacts of the remaining contamination on the property's potential redevelopment for various uses, including some uses which would not be consistent with the site's current industrial cleanup level. The redevelopment of the Dico property would be a logical extension of the area's revitalization and could serve to dramatically enhance one of the city's gateway entrances.

This report, funded by EPA's Superfund Redevelopment Initiative, attempts to address, to the extent possible, questions raised by the City of Des Moines regarding the potential redevelopment of the Dico property. Although the questions raised by the City prompted preparation of this report, it has been prepared to provide information of interest to any potential future developer of the property.



Report Objectives and Limitations

Cleanup activities on the Dico property have been conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The primary purpose of environmental investigations conducted on the property have been to support decisions about what actions were necessary to protect human health and the environment based on anticipated land uses, and may not provide sufficient information to make definitive statements regarding other potential future land uses. However, the investigations undertaken at this site do provide some insight into the site's condition that can form the basis for preliminary consideration of the property's future use.

This report presents an approach to thinking about the property's potential future use and one potential future use scenario. EPA is not advocating for any particular future site use, nor is it intending to limit any future site use options by issuing this report. EPA's role is to work with local stakeholders to ensure that site redevelopment activities take into account the existing contamination and remedial actions to ensure that the property is safe for future users.

In 1999, Barker, Lemar & Associates (BLA) prepared an initial redevelopment report for the City of Des Moines based on existing information. The BLA report contemplated that the complete removal, treatment, and/or replacement of all of the property's surface soils would be necessary for site redevelopment. The resulting remedial cost estimates far exceeded the property's market value such that redevelopment was not economically feasible. This report suggests an alternative approach: developing a reuse plan for the site that takes into account the site's contamination, incorporates remedial strategies that cap at least some of the site's waste in place, and aligns open spaces with site areas that are more likely to be either uncontaminated or to have lower levels of contamination.

The ideas presented in this report are intended to stimulate discussion and serve as the first step in an iterative process of reuse planning. In order to optimize this property's value both to the community and to developers, a reuse plan and a remedial plan must be developed in an integrated fashion. As this dialogue progresses and specific interest in the site's redevelopment increases, more data will be needed to inform decisions. Detailed market data and construction cost data, along with additional site sampling and remedial cost data, will need to be gathered as the project evolves.

The cost of remediating the property sufficiently to enable other uses can be controlled by focusing treatment and removal on "hot-spots" and, where appropriate, capping areas of contamination under structures and parking areas. Higher density uses that are compatible with the property's urban setting and the city's stated sustainability goals are consistent with this strategy. Greater density may both decrease the site property's remedial costs and increase project revenue, therefore greatly increasing the likelihood of project feasibility. A more dense development pattern that covers more of the site property's surface area with permanent structures may reduce the amount of soil that will need to be treated or removed from the site. The challenge will be to develop an attractive site design that meets these objectives, is acceptable to the community, and is desirable to the marketplace.

Data Analysis

Methodology

Much like the BLA Report, existing data were relied upon in conducting the present analysis. Existing data were compared to various standards commonly used to establish cleanup standards. These standards are identified in Appendix A. From this analysis, remedial alternatives and a possible future use scenario were developed. As stated in the report's introduction, these alternatives present one characterization of a limited pool of data; they do not represent a complete site characterization.

EPA's remedy selection process requires the development of cleanup standards appropriate to use at a given site. Cleanup standards are developed through a detailed risk assessment process, which depends in part on the anticipated use of the property, the location of the property, and the medium to which the standard applies. Where available, Iowa state residential standards were selected to characterize soil contamination and develop the proposed reuse scenario. The state background mean for arsenic was used for the analysis given the background levels in the state are significantly higher than soils standards. It is important for a developer to understand that the state standards used in this report may not reflect the final cleanup levels; actual cleanup levels will need to be developed in accordance with EPA's risk assessment process, taking into consideration the proposed use of the property.

All available data were analyzed to evaluate which contaminants were detected above the state standards. Sampling locations at which these contaminants were detected above standard values were then mapped to characterize the extent of contamination. In order to illustrate potential uses, certain assumptions were made about site property conditions in areas where no data were available. For example, in the absence of information to the contrary, it was assumed that soil beneath buildings would either be clean or at least less contaminated than soils around the buildings. Sampling data would be necessary to verify conditions under the buildings before an actual plan could be prepared. Maps reflecting contamination extent included both concentrations and depth of contamination. Although state standards were ultimately used to inform the remediation alternatives and proposed future use scenario, similar maps using other standard values were developed and used for comparison. Figures 1, 2, and 3 on the following pages present soil sampling locations with contaminants higher than state standards for metals, pesticides, and a composite of both contaminant types, respectively.

FIGURE 1. METALS ANALYSIS

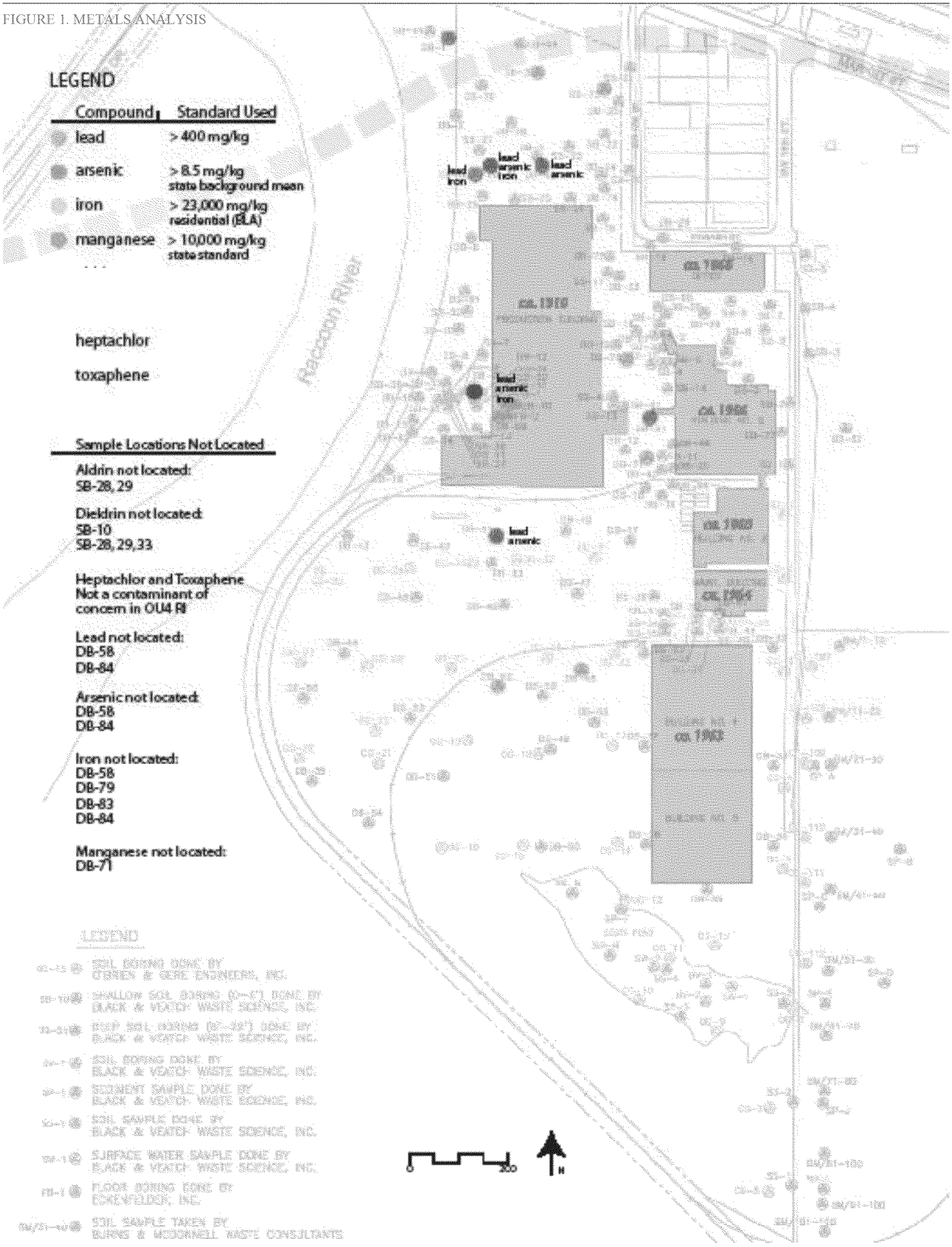


FIGURE 2. PESTICIDE ANALYSIS

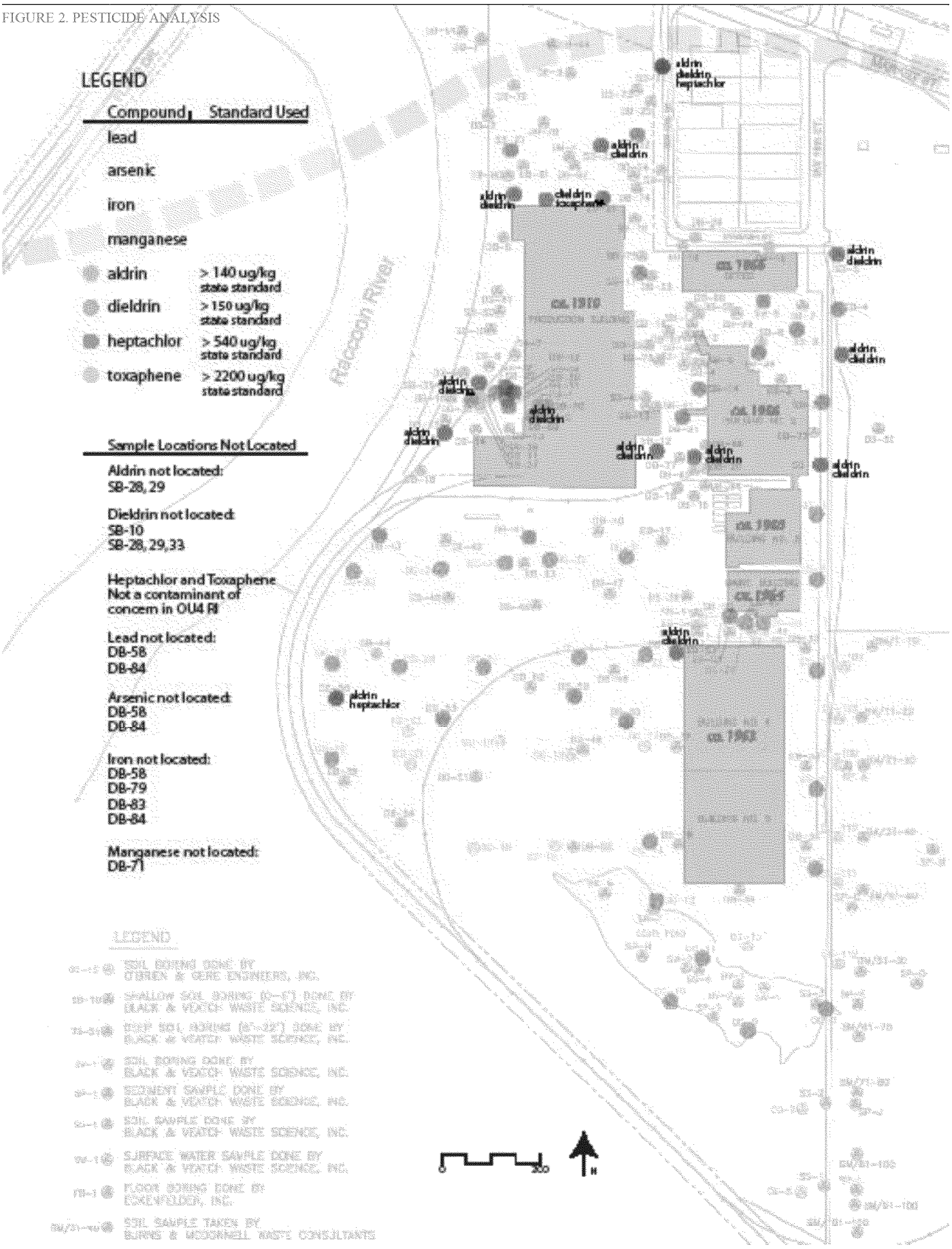
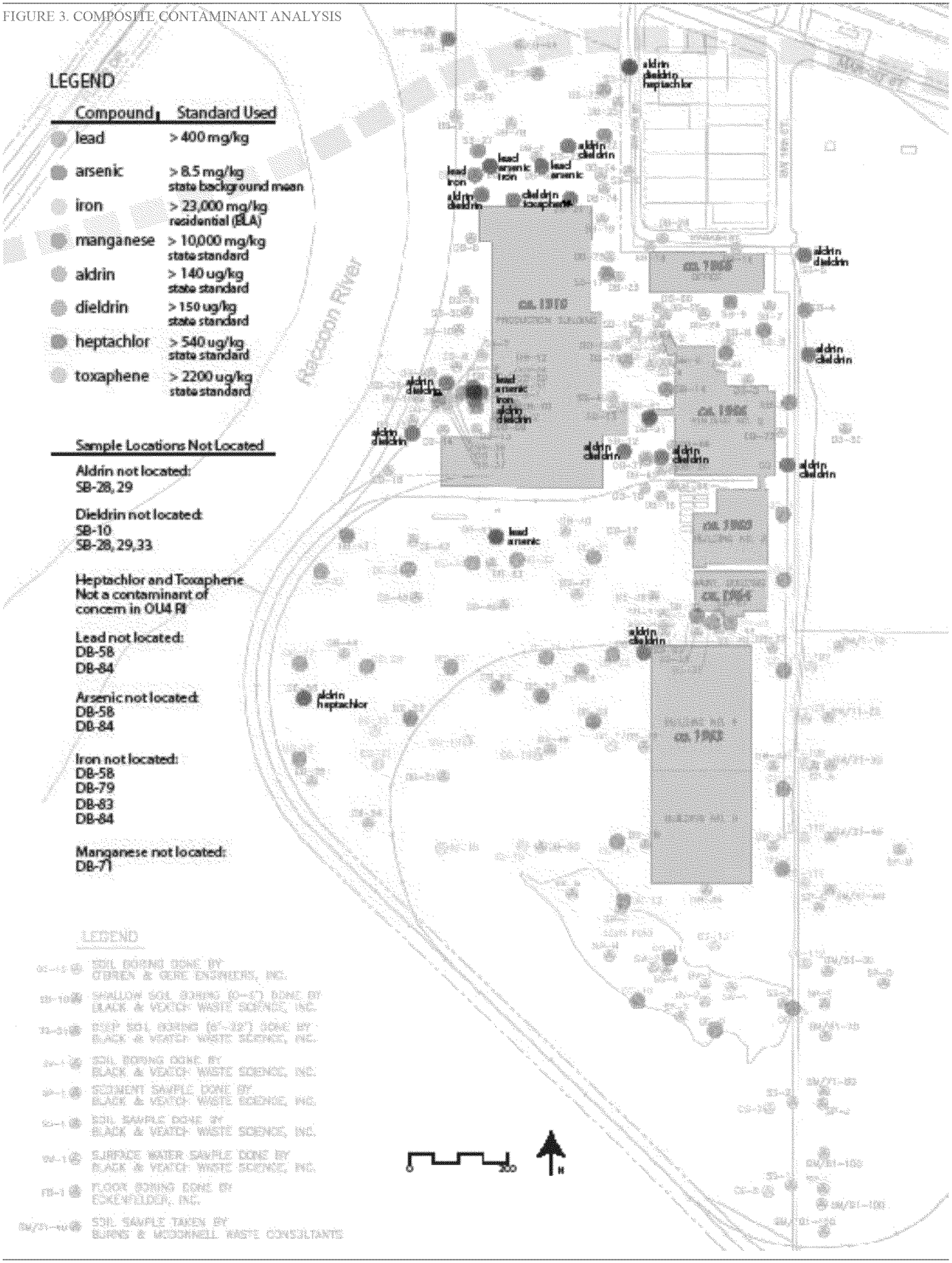
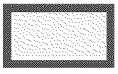


FIGURE 3. COMPOSITE CONTAMINANT ANALYSIS



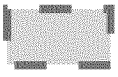
Contamination and Reuse Characterization

Based on the previous maps, contamination "hot spots" were identified and the spatial patterns of contaminants were evaluated. The type and extent of contamination was characterized to facilitate the evaluation of suitable redevelopment alternatives. The resulting contamination characterization was then used to develop potential remedial options and future use scenario. As stated previously, this analysis is based on a limited data set and is not meant to be a replacement for a formal risk assessment or additional sampling that will likely be necessary, depending on reuse goals for the site property. Initially, the site property was divided into four main areas based on the results of the contamination characterization. Those areas are depicted in Figure 4:



- Least Restrictive – Based on the available data and the assumptions described in the Methodology section of this report for cases where no data are available, e.g., soils beneath existing buildings are likely to be either free from contamination or contain limited amounts of contamination. Therefore, these areas may require little or no remediation prior to use.

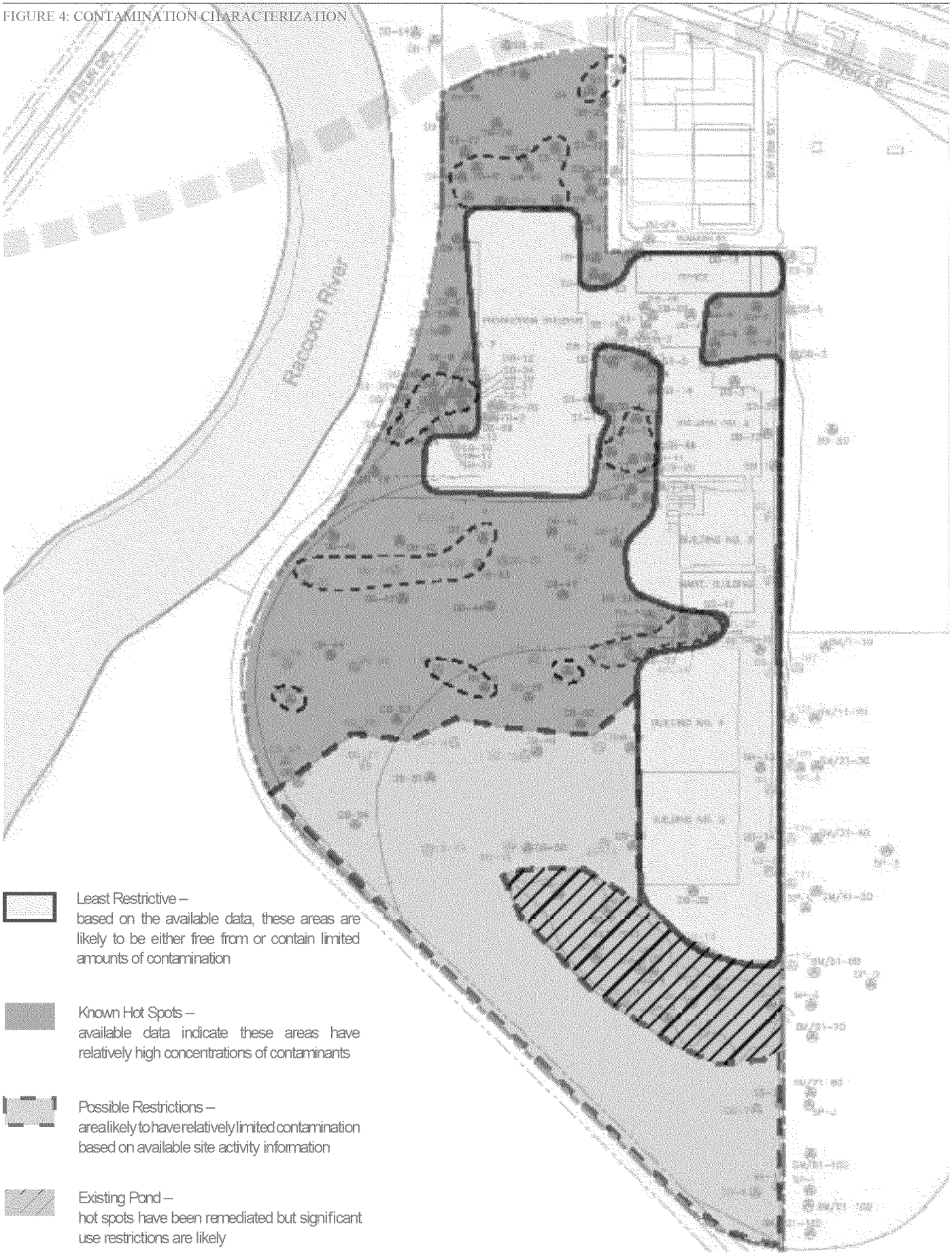
- Known Hot Spots – Available soil sampling data indicate that these areas have relatively high concentrations of several contaminants. Discrete areas within this contamination category that have particularly high and diverse contaminant concentrations would need to be addressed in an appropriate manner (e.g., treated, removed, covered, etc.) prior to reuse. Potential discrete hot spot areas are indicated with a dashed line in Figure 4.



- Possible Restrictions – The southwest portion of the site property is likely to have relatively limited contamination based on available site activity information. There are limited data available for soils in this area; further testing is needed.

- Existing Pond – Hot spots on the banks of the on-site pond, down to the water level, have been remediated, but some contamination probably remains in the pond sediments. Site surface water drains into this pond. Wildlife habitat has been documented in the pond (e.g. beaver activity). Due to the possibility that contamination remains in the pond, it is likely that significant use restrictions would be necessary. However, the pond's aesthetic value was incorporated into the future use scenario.

FIGURE 4: CONTAMINATION CHARACTERIZATION



Reuse Scenario

These broad categories of land contamination patterns were then considered alongside the site property's surrounding land uses and road network, including the proposed Riverpoint West development. Figure 5 presents how the site property's contamination and surroundings could inform the identification of access points and the extension of a road network across the site property. This information provided the basis for the development of the site property's future use scenario, which includes a combination of high-density residential development, mixed-use (commercial office, commercial retail, and residential) development, and passive and active recreation. Figure 6 presents an initial concept sketch as part of the overall design process to develop the site property's future use scenario. Figure 7 presents the future use scenario.

FIGURE 5. SITE PROPERTY ACCESS AND CONNECTIVITY

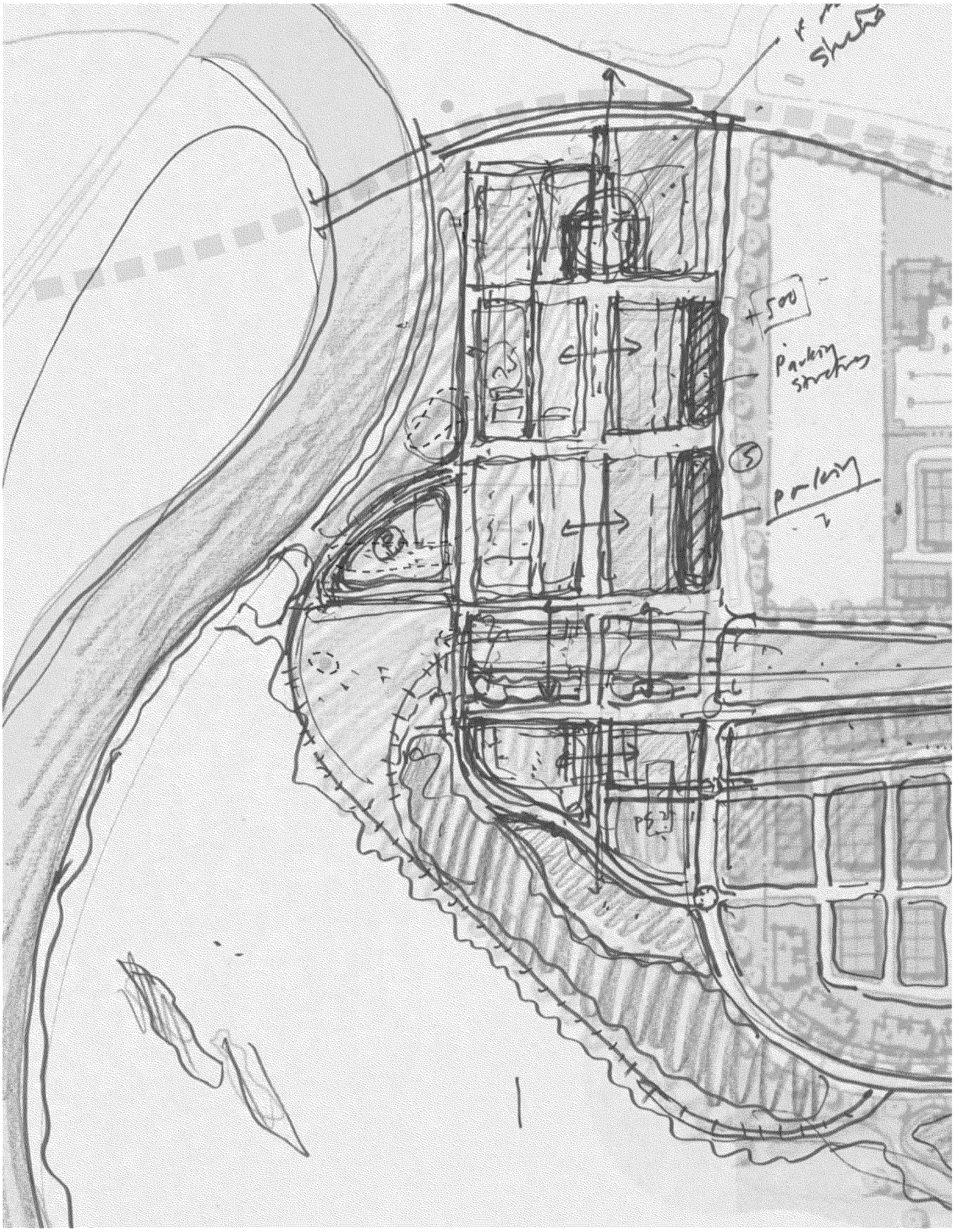
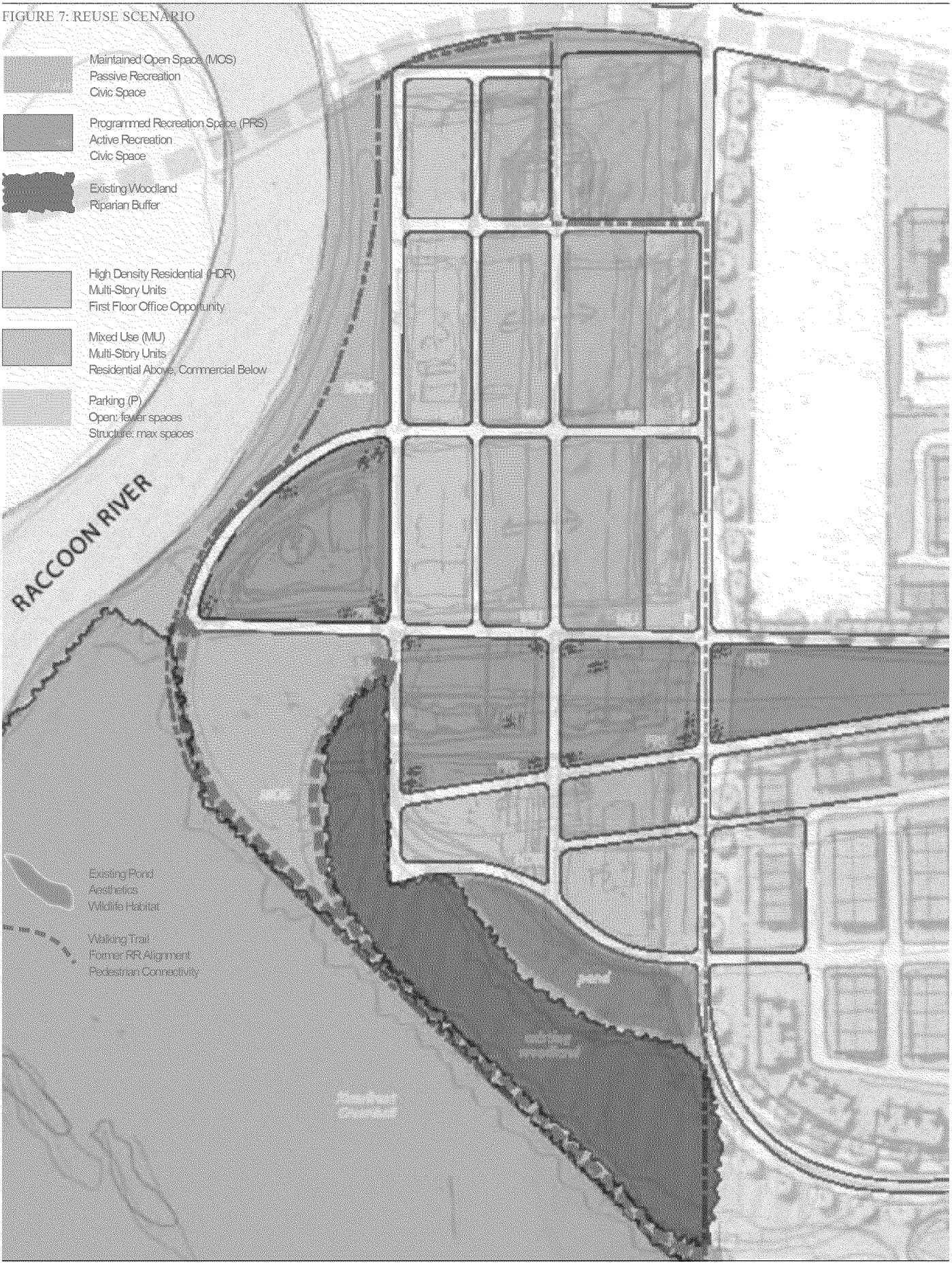


FIGURE 6. REUSE SCENARIO SKETCH

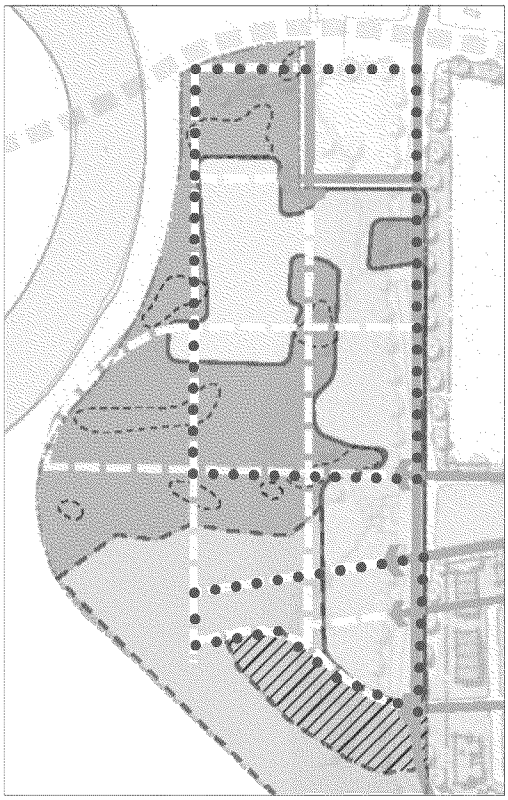
FIGURE 7: REUSE SCENARIO



Reuse Scenario (continued)

High-Density Residential, Mixed-Use, and Parking

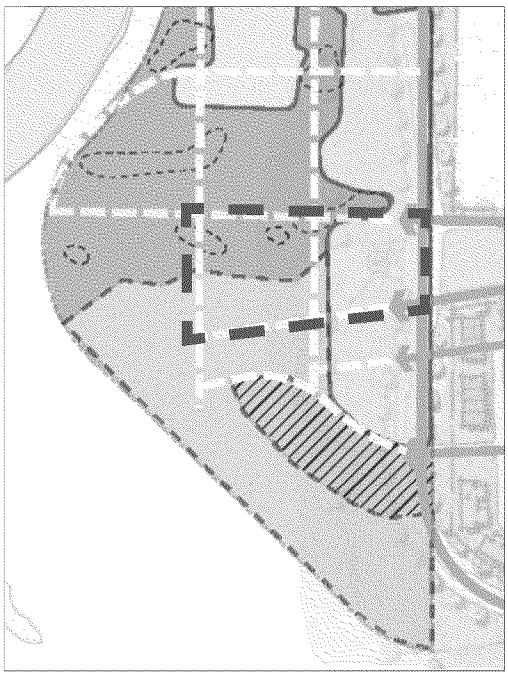
The large area outlined for high-density residential development, mixed-use development, and parking in the northern portion of the Dico property is located in an area that contains some of the site property's most significant soil contamination. Depending on future use goals, some of these "hot spots" could be remediated prior to the property's reuse (see the Remedial Options section of this report for further details). Otherwise, contamination in this area could be encapsulated by the construction of buildings, roads, and parking structures. This area also includes land that is likely to contain limited or no soil contamination. Depending on the results of additional testing, these areas could serve as locations for gardens or tree plantings. The location of high-density residential buildings in this area capitalizes on the area's proximity to the river, with its associated aesthetic and recreational benefits. Parking located east of buildings could serve as a buffer between the area's mixed-use development and the adjacent power substation. Depending on the future development's characteristics, this parking area could be a ground-level facility or a multi-level structure.



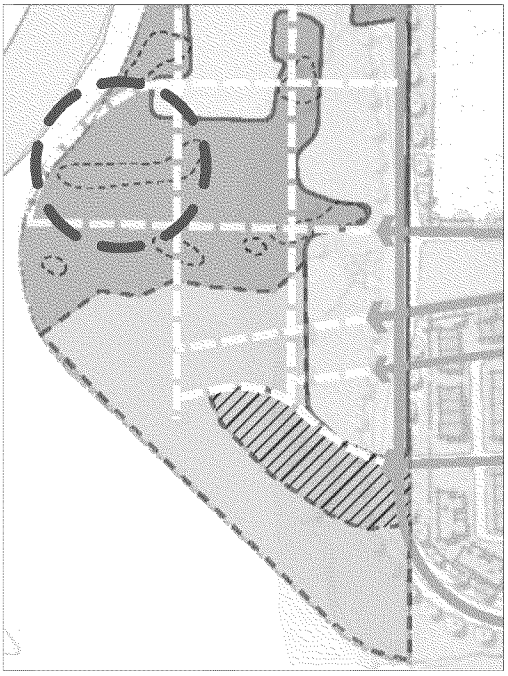
A second area of high-density residential and mixed-use development could be located in the southern portion of the property, adjacent to an active recreation area and an existing woodland riparian buffer. The siting of these land uses in this area would capitalize on surrounding natural features, including the on-site pond. In terms of soil contamination, high-density residential and mixed-use development in this area would be located on land that likely is relatively uncontaminated.

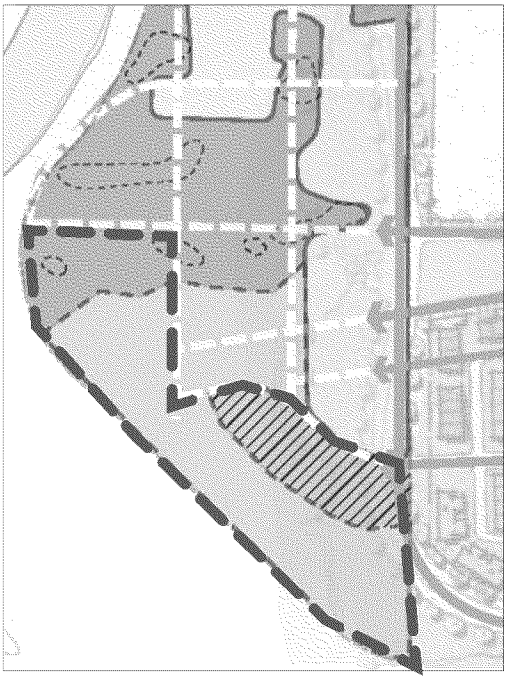
Programmed and Maintained Recreation Space

The future use scenario also includes several areas that could provide active recreation opportunities and civic space for future users, as well as for the adjacent Riverpoint West development. Two of these spaces would be located between the two areas of high-density residential and mixed-use development described above (see Figure 7). In terms of soil contamination, these two spaces contain land categorized as "least restrictive," "known hot spots," and "possible restrictions" (see Figure 4). Additional soil sampling would be necessary to further evaluate contamination in this area. Based on these results, areas could be designated for soccer fields (i.e., less contaminated) or hard court recreation, such as tennis or basketball courts (i.e., more contaminated). The relatively discrete "hot spots" in this area may be good candidates for excavation or in situ remediation, as described in the Remedial Options section of this report.



Reuse Scenario (continued)

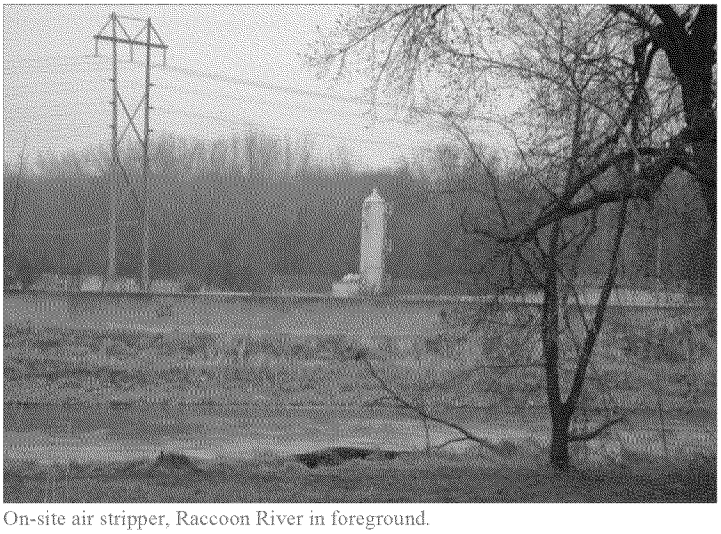




Programmed and Maintained Recreation Space

Another recreation area could be located west of the northern high-density residential development area (see Figure 7). This area also contains known "hot spots" and may also be a good candidate for in situ remediation. Contamination encapsulation using hard court recreation surfaces may also be an option for this space.

In addition to the active recreation areas described above, the future use scenario outlines several areas of maintained open space along the property's western edge that could be used for passive recreation and civic activities. This recreation area could be a good location for community education resources, including the placement of industrial artifacts and information areas that document the site property's past uses, remediation, and successful return to use. The air stripper currently operating to address groundwater contamination is located in the southern portion of this maintained open space.



On-site air stripper, Raccoon River in foreground.

Reuse Opportunities

In addition to developing a framework for integrating on-site contamination and future land use considerations, the reuse scenario also reveals several larger-scale opportunities and key ideas that can help inform future planning efforts for the Dico property over both the short and long-term. This section of the report explores three opportunities in particular: linking and integrating the site property with its surroundings, recognizing and celebrating the area's community and industrial heritage, and pursuing a planning and design approach for the site property that reflects the City's interest in sustainable design and green development.

Connectivity and Integration with Surrounding Land Uses

The new MLK Parkway creates a western gateway into the heart of downtown Des Moines. The Dico property is an important part of this entrance gateway, and part of a larger area that is in the midst of significant regeneration and growth. Accordingly, the Dico property's redevelopment need not only provide on-site benefits; it can also play an important role in supporting the establishment of the city's western gateway and the area's social and economic resurgence.

To achieve these larger objectives, it is important to recognize the relationship of the site property with its surroundings. The site property's surroundings include an existing urban context of buildings and roads as well as natural systems, and the site property is located in close proximity to a range of amenities. Accordingly, the reuse scenario focuses on potential opportunities to maximize connections between the site property and its surroundings. The scenario recognizes that multiple forms of transportation infrastructure, including pedestrian and bike routes, public transportation linkages, and roads will enable area residents, business owners, and visitors to access the area's natural resources and move easily between the Dico property and the adjacent Riverpoint West development.

These linkages will help create attractive corridors that will serve as community amenities, reduce traffic congestion, address community safety concerns, and provide a range of secondary economic benefits, like increased property values and tax revenues for the City of Des Moines. Early planning and coordination with the Riverpoint West development will be important in order for these connections to be as appropriate and effective as possible (see Figure 5). Finally, the reuse scenario focuses not only on linking the Dico property and surrounding properties with the area's natural resources – the Raccoon River and Gray's Lake – but also on enhancing these resources by preserving river views and creating a levee walk that could connect with local and regional trail systems.

Gateway to the city, MLK Parkway

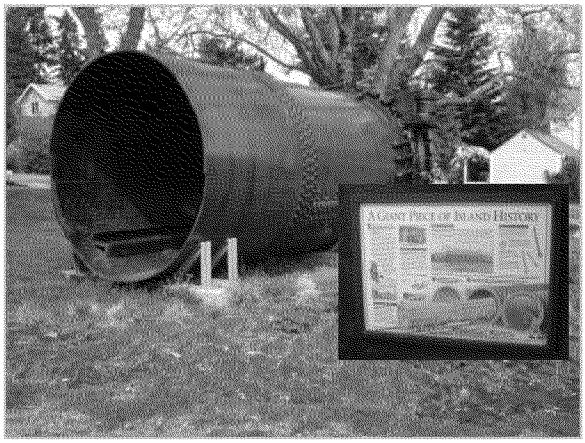
Dico property along Raccoon River

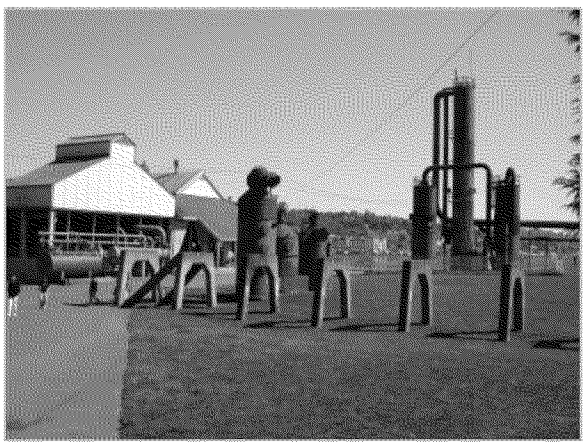
Reuse Opportunities (continued)

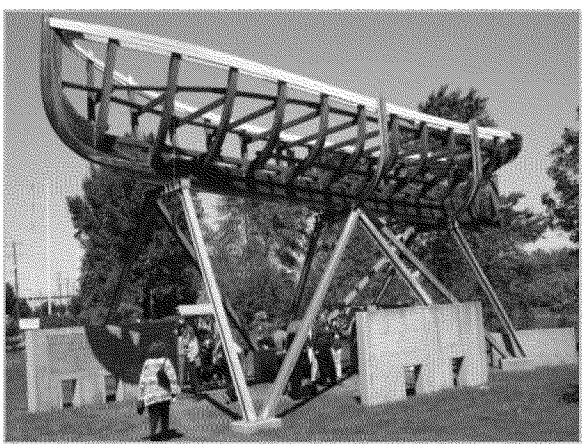
Industrial Heritage

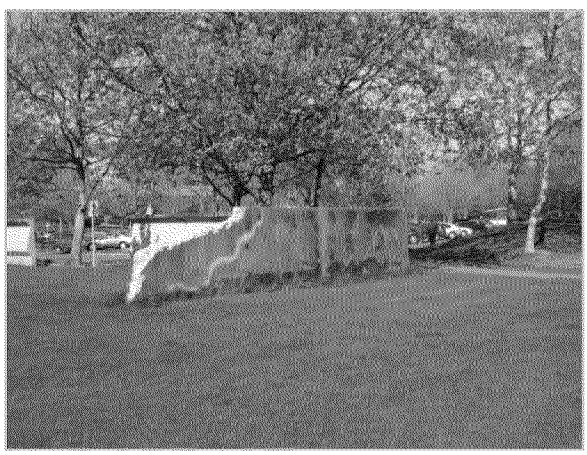
Communities across the United States are recognizing the importance of preserving their industrial history. These manufacturing facilities created products and supported jobs for decades, representing a vital part of a community's heritage. Today, as new recreation areas, subdivisions, and office parks replace many of these older industrial areas, communities are discovering that their partial preservation and restoration means that these areas can also serve as educational centers, community resources, and attractive destinations for tourists.

In Des Moines, facility operations at the Dico property represent an important part of the community's history. Remnant features from former facility operations, including the foundry, offer a significant opportunity to recognize and preserve the area's unique history, particularly as local land uses change from industrial to urban commercial, residential, and recreational uses. Salvaged materials from the foundry building could be adaptively reused to construct new facilities, such as a pavilion, or could be installed as sculpture in open space areas. Former site property uses and circulation patterns could be incorporated as part of future uses by aligning trails along the two former rail spurs, as indicated by brown dashed lines in the reuse scenario. The air stripper, a remedy component, could also be integrated as part of the industrial artifacts located throughout the proposed open space areas. Finally, educational facilities and signage at the property could provide residents and visitors with information on the property's former uses, remediation, and successful return to use.









Industrial artifacts preserved in open space across (images from various facilities in Washington state).

Reuse Opportunities (continued)

Sustainable Design and Green Development

Past uses at the Dico property resulted in contamination of the property's soils and groundwater. Planning for the property's redevelopment represents an opportunity to create a new development plan that addresses the natural world alongside the community's social and economic priorities in a sustainable, community-focused way. An ecologically sustainable reuse plan for the Dico property could focus on three areas: the protection of natural systems, resource efficiency, and innovative stormwater management.

Protection of Natural Systems

An ecologically sustainable reuse plan for the Dico property could include a detailed assessment of the property's natural features. The reuse scenario presented in this report provides an initial overview of this urban landscape's ecological components, and suggests future land use opportunities that could allow for the continued protection of these natural resources. The preservation of the pond located on the property, for example, would allow this water body to maintain local hydrologic functions like drainage and also serve as wildlife habitat and as a visual amenity for residents, business owners, and visitors. Maintenance of the woodland and buffer area currently located along the Raccoon River would mean that this area can continue to support local water quality, reduce soil erosion, provide hazard mitigation benefits, and serve as wildlife habitat as well as a recreational resource.

Resource Efficiency

Resource efficiency – the efficient use of land, soils, water, minerals, timber, fossil fuels, and energy (electricity as well as renewable energy sources like solar energy) – is a powerful way to both reduce project costs and provide environmental benefits. An ecologically sustainable reuse plan could evaluate opportunities for resource efficiencies across the Dico property, addressing areas like site layout, building design, materials selection, and systems design processes.

Buildings, for example, could be designed with green roofs, rain barrels, and cisterns to sequester carbon and recycle rainwater for irrigating plantings. Buildings could be designed to incorporate recycled materials and minimize resource needs, and be situated to maximize natural lighting and harness solar energy, reducing facility energy demands. As outlined in the Recycling Building Materials section of this report, it may also be possible to adaptively reuse building materials salvaged from the demolition of on-site buildings at the Dico property.

Resource efficiency strategies also extend across a site, including outdoor areas as well as buildings and facilities. Native plant selections in a planting plan can reduce water, nutrient, and maintenance needs. In proposed recreation areas, low-maintenance grasses can be selected for planting. Maintenance costs can be further reduced through the creation of no-mow or low-mow areas within maintained open space. These areas can also serve as wildflower meadows, prairie ecosystems, and wildlife habitat. Strategic placement of trees around buildings can help reduce energy use costs, providing shade during the summer and allowing sunlight to pass through in the winter. Finally, at a larger scale, trees' absorption of sunlight and carbon in the atmosphere helps mitigate the heat island effect and offsets carbon emissions, helping to address climate change.

Reuse Opportunities (continued)

Innovative Stormwater Management

The construction of buildings and impervious surfaces like parking lots can result in high velocity stormwater flows from rain events that erode stream banks, concentrate pollutants, and damage ecosystems. However, innovative approaches to stormwater management like low-impact development (LID) techniques can strengthen a reuse plan and mimic the benefits provided by natural systems.

Designed plantings like swales and rain gardens can slow stormwater flows, provide infiltration opportunities, and filter pollutants, improving water quality and watershed health. Impervious materials like asphalt that are traditionally used for parking lots and other facilities can be replaced with pervious materials, like pervious pavement, that enable rainwater infiltration and reduce stormwater flows. Any consideration of the use of pervious pavement at the site must also take the site's contamination into account. There may be portions of the site, for example, where capping of site soils may be required.

Rainwater collection systems like cisterns and rain barrels can be incorporated into the design of buildings and allow for rainwater to irrigate planted areas or as gray-water recycling for non-potable uses. The incorporation of green roofs as part of building design also captures, slows, and filters stormwater flows. Given the Dico property's proximity to the Raccoon River, an ecologically sustainable reuse plan that incorporates these techniques will be of particular importance.

Examples of innovative stormwater management techniques. Top: two different types of pervious pavement options. Bottom left: a rain garden captures and filters stormwater runoff. Bottom right: a vegetated swale with check dams to slow and filter runoff.

Remedial Options

Components of the site's remedy include a pump and treat air stripping system to address volatile organic compound (VOC) groundwater contamination, an asphalt cap to prevent exposure to contaminated soils, and land use restrictions. Potential remedy modifications and remedial options outlined below are preliminary suggestions based on the analysis of available information. Further testing and research will be necessary to determine if these suggestions are feasible at the site property. Costs associated with these system modifications and remediation technologies vary widely and will likely be best estimated by a local contractor with knowledge of local market factors.

Groundwater Remediation

Under EPA oversight, the DICO Company designed and built a pump and treat system to address groundwater contamination at the site property. This system includes a series of extraction wells and an air stripping system that have been in operation since December 1987. The system uses extraction wells to collect contaminated groundwater, removes contaminants from the water with an air stripper, and discharges the treated water to the Raccoon River. The goal is to control migration of the contaminated groundwater and protect the Des Moines public water supply.

Various modifications to the pump and treatment system have been implemented over the course of its operation. For example, certain extraction wells have been shut down and the monitoring requirements have been significantly reduced. It is possible that additional modifications could be made to the system to accommodate future reuse. There are several treatment technologies that have the potential to reduce overall treatment time and make the system less obtrusive for future property users. The timeframe for system operation might be reduced using innovative in situ technologies. It may also be possible to reduce the size of the air stripper, replace it with portable groundwater treatment units, or flush mount the extraction wells.

Soil Contamination, "Hot Spots"

The results of this report's analysis indicate that there are several "hot spots" that contain high concentrations of several organic and inorganic contaminants (see the Data Analysis section of this report for further details). Due to the diversity of contaminants and relatively discrete nature of these areas, the analysis suggests that the best approach for remediation of these areas may involve soil excavation, disposal, and the addition of clean fill. Another possible approach could involve placing permanent structures such as buildings over these "hot spots." Construction activities in these areas would likely require significant restrictions to prevent exposure to and spreading of contaminants, but after construction, the contaminants would essentially be encapsulated, therefore preventing exposure. Institutional controls could then be implemented to prevent future exposure.

If buildings are constructed to encapsulate and prevent exposure to "hot spot" contamination, then vapor intrusion should likely be considered during the site's redevelopment. Vapor intrusion can occur when volatile and semi-volatile compounds in contaminated soil or groundwater release vapors that rise and penetrate buildings. Through strategic planning during the development process, engineering controls that provide a cost-effective method of reducing potential vapor intrusion exposure can be added during construction.

Remedial Options (continued)

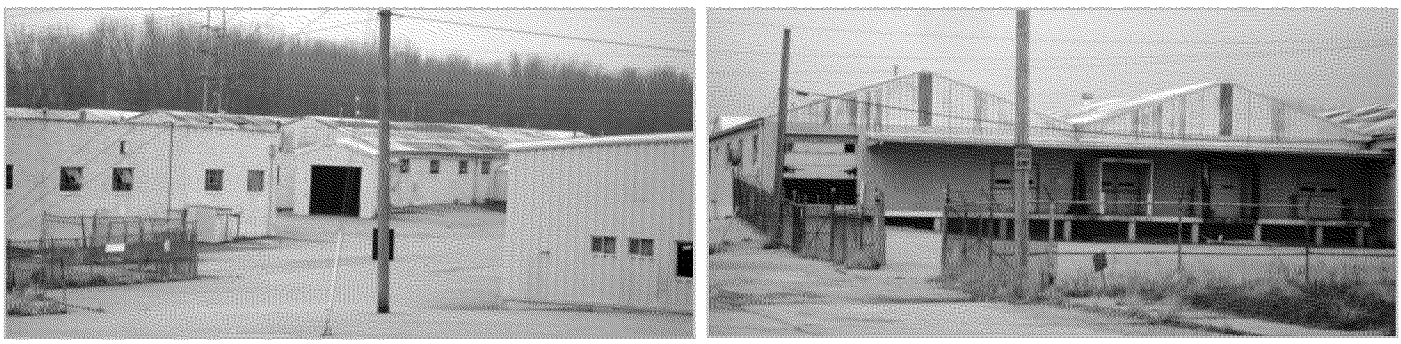
Soil Contamination, Pesticides

Pesticides, particularly aldrin and dieldrin, are widely distributed in site property soils. Aldrin is largely concentrated in the areas identified as "hot spots" and would be addressed by remediation of these areas of concentrated contamination. However, dieldrin has been detected in many areas of the site property not identified as "hot spots" (see the Data Analysis section of this report for further details). Like the "hot spots," soil excavation is a potential remedial option for pesticide-contaminated site property soils. However, due to the large area impacted by pesticide contamination, other in situ remedial technologies may offer a more cost effective and efficient approach.

Building Materials

In March 1994, under EPA oversight, the DICO Company conducted a removal action addressing contamination inside on-site buildings. Interior surfaces were cleaned, building walls and floors were encapsulated, and interior building insulation containing PCBs was secured. Additional testing will likely be necessary to determine whether there is residual aldrin, dieldrin, chlordane, and dioxin contamination under the wall and floor surface coatings. Depending on the results of this sampling and future goals, one potential option would be to recycle on-site building materials. Buildings could be tested, cleaned (if necessary), modified, and reused. If this is not consistent with reuse goals, another option would be to systematically demolish site property buildings and reuse the raw materials for on-site development. In addition to providing building materials at no cost, this option would reduce the costs associated with disposing of the building materials (please see the Recycling Building Materials section of this report for further details).

If recycling the building materials on-site is not desirable or feasible, another possibility is to seek approval from Iowa DNR to dispose of the materials as "special waste" at the Des Moines landfill. If approved by Iowa DNR, this would provide a lower cost alternative to disposing of the waste at a hazardous waste disposal facility. Similar to the building recycling scenario, additional testing of the floors, walls, and insulation would likely be necessary to support the "Request for Special Waste Authorization." The Iowa DNR Web site indicates that "pesticide and other chemical waste containers", "pesticide contaminated soil," and "PCB contaminated waste" are accepted at the Des Moines landfill, so it appears that, depending on contaminant concentrations in the building materials, it is possible that Iowa DNR may approve disposal of these wastes in the Des Moines landfill (www.iowadnr.com/waste/sw/permitting.html).



Existing buildings located on the Dico property

Recycling Building Materials

There is an opportunity to generate revenue, reduce landfill input, and create jobs if deconstruction and recycling were the methods selected for building removal at the Dico site property. Existing structures and infrastructure, including concrete slabs, building materials, and roadways, could potentially be adapted and recycled for future use.

Advantages and Disadvantages of Building Demolition and Recycling

Demolition
Demolition is the complete destruction and bulldozing of a structure. The building materials and contents are then landfilled.

Advantages
- Quickest way to open space
- Requires the least effort

Disadvantages
- Public benefits may not be maximized
- High costs of demolition and landfill fees
- Salvageable materials are landfilled
- Noise and dust issues

Major Steps
- Bid out and award demolition contract
- Perform contamination inspection
- Demolish building(s)

Deconstruction and Recycling of Building Material
Deconstruction is the strategic disassembly of a structure (construction in reverse) in order to retrieve all or portions of salvageable materials, such as building materials, roof, and foundation for recycling and/or reuse.

Advantages
- Building materials are recycled
- Demolition and landfillcosts are saved
- Landfillingof demolition waste is significantlyreduced
- Large-scale deconstruction projects (which require many workers) offeropportunities for job training and creation

Disadvantages
- Limited demand for recycled building materials
- Labor and time intensive
- Materials and construction techniques used in structures built after 1950 are not ideal for deconstruction
- Specialized worker training may be required

Major Steps
- Determine deconstruction and recycling potential of each building
- Obtain adequate storage space for recycled materials while also soliciting interest from public agencies, non profitorganizations, and/or private industries
- Perform contamination inspection
- Obtain necessary permits
- Deconstruct building(s)

Potential Building Materials Recovery, Recycling, and Reuse at the Dico Site Property

Concrete: The most typical reuse for recycled and crushed concrete is as back fill or base for new roads. Concrete can also be crushed and reused as a raw material for new concrete. Crushing equipment can be brought on-site, or recycled material can be carried to a nearby recycling facility.

Brick: Bricks recycled from deconstruction sites generally must be whole and suitable for building construction. Imperfect bricks can be crushed and used as backfill.

Metals: Metal sheets and pipes, including tin, cast iron, steel, aluminum, and stainless steel can all be sent to scrap recycling facilities where they are melted down and used to produce new products. As metal is recycled, it maintains its strength and integrity so that it can be incorporated back into the metal manufacturing process.

Process for Changing Land Use

This section of the report was written by EPA Region 7. This section describes the process a developer would have to go through in order to change remedial strategies to allow for a different land use at the Dico property. Table 1 outlines the parties that may be involved, and the relative time frames for each stage in the process.

In order to allow a land use different from the current industrial land use, the level of protectiveness afforded by the existing remedy would have to be evaluated. The Superfund process calls for remedial actions to be selected consistent with the most reasonably anticipated land use. The existing remedial actions at the Dico site property were selected based on an industrial land use, the most reasonably anticipated land use at the time the decisions were made. If a new land use is desired, the level of protectiveness must be evaluated and additional remedial measures may be called for in order to protect human health and the environment.

EPA reviews certain remedies periodically (no less often than every five years) to ensure that the remedy remains protective of human health. The most recent review for the Des Moines TCE site concluded that the remedies remain protective for the current (industrial) land use. In addition to these periodic reviews, EPA recognizes that remedies may be reviewed over time and may be modified if new technologies become available, or if the land use is significantly changed. The purpose of this type of remedy review may be to optimize the remedy, increasing operating efficiency or saving O&M costs, or to accommodate redevelopment. These types of remedy reviews are not required by CERCLA, but may be conducted by EPA or other parties. The EPA guidance document entitled "Reusing Superfund Sites: Commercial Use Where Waste is Left Onsite" states the following:

"Where hazardous substances, pollutants, or contaminants remain on site above levels that would allow for unlimited use and unrestricted exposure, EPA conducts reviews at least every five years to ensure that the remedy remains protective. Should land use change, it will be necessary to evaluate the implications of that change for the protectiveness of the selected remedy.

In many cases, a completed remedy may not be able to accommodate the planned use without modification because of technical, legal, or other factors. If, in the future, landowners or others decide to change the land uses in such a way that makes further cleanup necessary, EPA does not prohibit them from conducting such a cleanup, so long as protectiveness of the remedy is not compromised. Retrofitting an existing remedy to support reuse requires careful planning, design, coordination with, and approval by, EPA and other regulatory agencies."

In order to allow a remedial alternative different from the existing remedial alternatives, several steps would need to be taken. The necessary steps would depend upon the desired end land use and the types of actions needed to support that land use. Some general steps are identified below and are included in more detail in the table. This analysis assumes that the redevelopment and any remedy enhancements would be done by the owner of the property. If the redevelopment were to be done by someone other than the property owner, the process outlined below may be slightly different.

If the property is to be used for industrial purposes, the buildings on the property would require repair and maintenance activities to ensure the protection of workers. This scenario would be a continuation of the operation and maintenance (O&M) plan approved for the current land use. O&M are the activities conducted after a Superfund site remedial action is completed to ensure that the site remedy remains protective in the future. The O&M plan for the Dico property can be made available through EPA.

Process for Changing Land Use (continued)

If the property is to be used for other than industrial purposes and the buildings are to be razed, then additional characterization of the building materials and soils beneath the buildings would be needed. This would likely include soil sampling and concrete core sampling. This information would be used to determine the most appropriate method of building demolition or deconstruction, whether the building materials could be reused or used as onsite fill, or the appropriate method of disposal. The soil sampling information would be used to determine the most appropriate use of the areas the buildings currently occupy and would identify whether any remedial actions are necessary to support that use.

If the redevelopment project would entail removal of the asphalt cap and exposure to soils beneath the cap, then additional sampling and remedial measures for the contaminated soils may be required. This would likely include excavation in areas of higher concentrations and backfilling with clean soil. If the redevelopment project entails raising the elevation of the site (i.e. bringing in fill material or using approved building materials as fill), and contaminated soils will remain capped, then excavation may not be required. However, restrictions would be required to prevent future activities that could disturb or expose contaminated soils.

The existing groundwater extraction and treatment system effectively controls migration of the VOC plume. Any change in land use must provide for long term control of groundwater migration, either by continued operation of the existing system or by implementation of alternate treatment methods. The use of alternate treatment methods could be explored by performing an optimization study of the groundwater extraction and treatment system. Such a study could include an evaluation of technologies which could be employed to address source soils in order to reduce the time frame required for operating a migration control system.

Following completion of any characterization work and/or an optimization study, EPA, in consultation with IDNR, would prepare a Record of Decision (ROD) Amendment to document any changes to the existing remedial actions. The ROD Amendment would identify additional institutional controls necessary to support the new land use. The ROD Amendment would include an updated risk assessment to evaluate exposure pathways and cleanup levels for the newly proposed land use. Under CERCLA, a public comment period is required for ROD Amendments. EPA would hold a public meeting to present the new plan for remedial action and would respond to any comments received. The interested developer could also participate in this meeting or in separate community meetings to present its plans for future development.

Following completion of the ROD Amendment, EPA and the developer would negotiate the terms of an agreement (Consent Decree) for the implementation of the remedial actions selected in the ROD Amendment. This would include provisions for the design, construction, O&M of the selected remedial actions, as well as reimbursement of EPA's oversight of these activities.

Process for Changing Land Use (continued)

Table 1. Process for changing land use of the Dico Property

Work Needed	*Lead Party Options*	*Time Frame*
Continued O&M of existing remedies	Dico/city/developer/state	Until alternate Remedial Action (RA) is in place
All Appropriate Inquiry	City/developer	6 months
Transfer of Title	All parties	6 months – can occur concurrent with other steps
Assessment/optimization	EPA/Dico/city/developer	6 months
Risk Assessment	EPA/state	3 months
ROD Amendment	EPA	3 months
Negotiate Consent Decree	EPA/city/developer	6 months
RD/RA alternate remedial actions	City/developer	12 months
RD/RA oversight	EPA/state	Concurrent with RD/RA
Site Redevelopment	City/developer	2-4 yrs?
O&M alternate remedial actions	City/developer	12 months
Site Completion	EPA	3 months

Process for Deleting the Site from the NPL

The Superfund process entails a number of steps leading to deletion of a site from the NPL. These steps include but are not limited to Remedial Investigation and Feasibility Study (RI/FS), Record of Decision (ROD), Remedial Design and Remedial Action (RD/RA), and Operation and Maintenance (O&M). This analysis will begin at the O&M phase.

Following completion of or at a certain point during O&M, there is an event called Site Completion, which must be achieved before Site Deletion can begin. EPA is the lead on the Site Completion event. The criteria for Site Completion include:

- Cleanup goals in all RODs are met
- Institutional Controls (ICs) are in place
- All RA reports are completed
- All decision documents (RODs, ROD Amendments, etc) are completed
- Site is protective of human health and environment
- Only remaining activities are O&M performed by state or Potentially Responsible Party (PRP)

Site Completion is documented with a Final Close Out Report (FCOR). The FCOR is prepared by EPA and reviewed by the state and EPA Headquarters. The FCOR is signed by the Regional Administrator.

Process for Deleting the Site from the NPL (continued)

Following signature of the FCOR, the Site Deletion process can begin. The EPA is the lead on the Site Deletion event. The process for Site Deletion includes the following steps:

- EPA prepares the Draft Notice of Deletion (NOID)
- State/EPA Headquarters review and comment
- State must concur
- EPA compiles the deletion docket
- EPA publishes NOID in Federal Register
- 30 day public comment period
- EPA prepares responsiveness summary
- EPA publishes Notice of Deletion (NOD) in Federal Register

The Des Moines TCE Site is currently in the O&M phase. Most cleanup goals have been met in association with the various response actions that have been completed. However, the cleanup goals were established for an industrial use scenario. A change in land use would require an evaluation of cleanup goals and risks associated with a different land use. Also, all institutional controls have not been implemented, so the site is not currently ready for Site Completion.

For most sites, the main factor in controlling the time frame for Deletion is achieving all cleanup goals. Early in the Superfund program, EPA commonly set cleanup goals for groundwater sites at drinking water standards (Maximum Contaminant Levels (MCLs), established under the Safe Drinking Water Act). After many years of operating pump and treat systems, EPA has learned that some sites may never achieve MCL concentrations in groundwater, due to complex hydrogeological conditions or the presence of dense non-aqueous phase liquids (DNAPLs). As EPA reviews remedies over time, it may be necessary to revise cleanup goals based on an understanding of what available technologies can achieve at the time of the review.

EPA regulations provide a variety of options for EPA to follow when changing an existing remedy, depending upon the nature of the changes being made. These options range from placing an explanatory memo in the site file to following a formal record of decision (ROD) amendment process comparable to the original remedy selection process. At the Des Moines TCE Site, the potential for a change in land use will likely necessitate a ROD Amendment. As part of the ROD Amendment, EPA can specify cleanup goals that will be achievable within a reasonable time frame. In this way, Site Completion and Deletion can proceed, even if certain O&M activities continue to be required over the long term. The ROD Amendment will also include criteria for determining when the migration control system can be modified or shut down.

Appendices

Data Analysis Appendix A

Matrix of standard values for contaminants in site soil samples

Compound	RBC Region 3 residential (Barker Lemar)	RBC Region 3 industrial (Barker Lemar)	RBC Region 3 residential (4/7/06)	RBC Region 3 industrial (4/7/06)	State Soil Standard	State Soil Standard (with background)	State Background Mean	State Background Max
arsenic	0.43 mg/kg	3.8 mg/kg	same	1.9 mg/kg	1.9 mg/kg	19 mg/kg	8.5 mg/kg	23 mg/kg
iron	23,000 mg/kg	na	same	na	na	na	na	na
lead	7.8 ug/kg	200 ug/kg	na	na	400 mg/kg	na	21 mg/kg	1450 mg/kg
manganese	1600 mg/kg	na	same	na	10,000 mg/kg	na	745 mg/kg	2440 mg/kg
chromium	230 mg/kg	na	55,000 mg/kg	na	97,000 mg/kg	na	33 mg/kg	257 mg/kg
chlorinated	na	na	na	na	na	na	na	na
arochlor 1260	320 ug/kg	2900 ug/kg	same	1400 ug/kg	na	na	na	na
dieldrin	40 ug/kg	360 ug/kg	same	180 ug/kg	150 ug/kg	na	na	na
aldrin	38 ug/kg	340 ug/kg	same	170 ug/kg	140 ug/kg	na	na	na
toxaphene	580 ug/kg	5200 ug/kg	same	2600 ug/kg	2200 ug/kg	na	na	na
heptachlor	140 ug/kg	1300 ug/kg	same	640 ug/kg	540 ug/kg	na	na	na
chlrodane	1.8 mg/kg	16 mg/kg	same	8.2 mg/kg	8.1 mg/kg	na	na	na

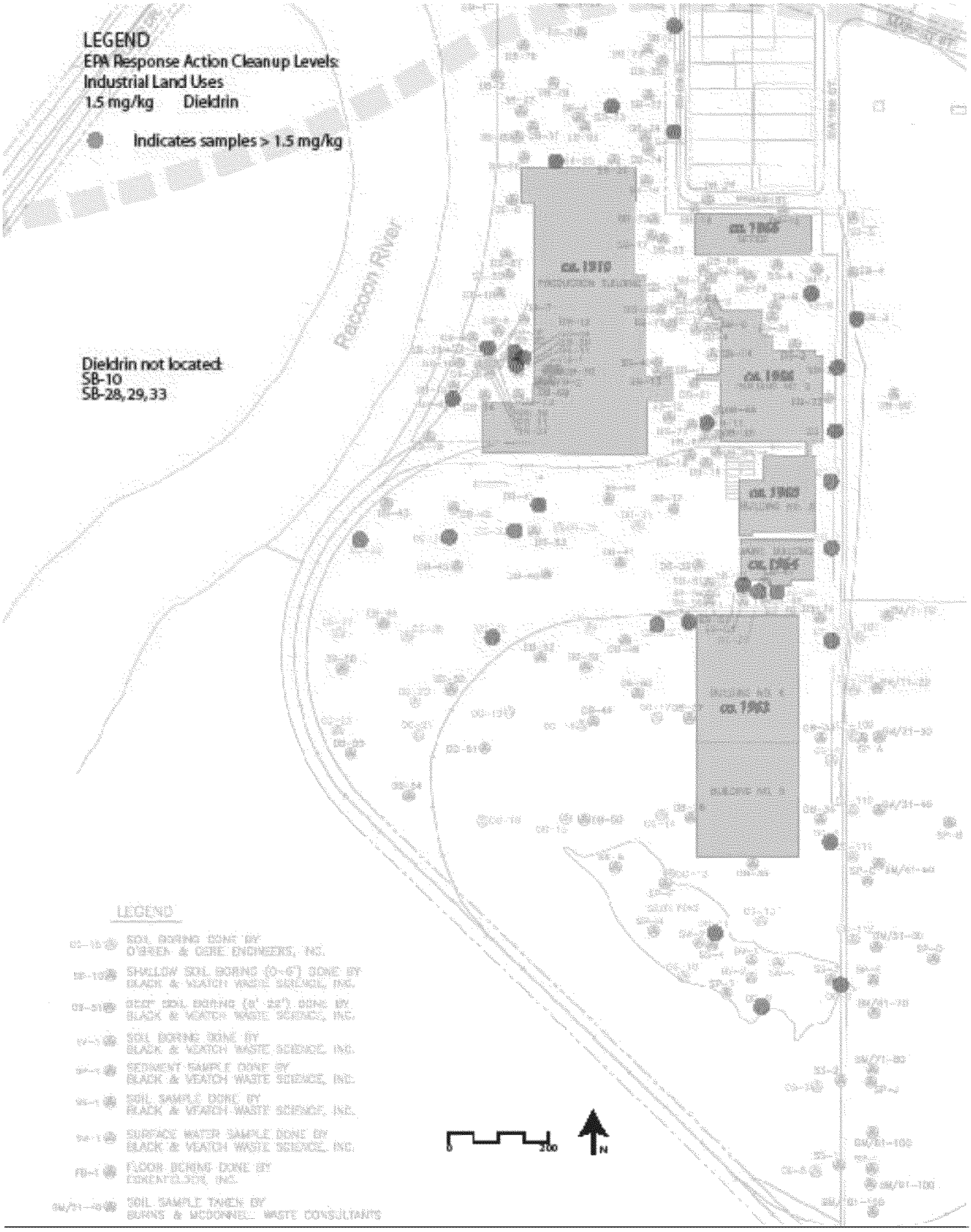
Compound	Region 6 Human Health Medium Specific Residential Screening Levels 2006	Region 6 Human Health Medium Specific Industrial Screening Levels 2006	Region 9 Preliminary Remediation Goals (2004) Residential	Region 9 Preliminary Remediation Goals (2004) Industrial	SCDM cancer risk	SCDM non cancer risk	EPA Response Action Cleanup Levels: Industrial Land Uses
arsenic	0.39 mg/kg	1.8 mg/kg	0.39 mg/kg	1.6 mg/kg	0.43 mg/kg	23 mg/kg	
iron	23,000 mg/kg	na	23,000 mg/kg	na	na	na	
lead	400 mg/kg	800 mg/kg	400 mg/kg	800 mg/kg	na	na	
manganese	3200 mg/kg	na	1800 mg/kg	na	na	11,000 mg/kg	
chromium	100,000 mg/kg	na	100,000 mg/kg	na	na	230 mg/kg	
chlorinated	na	na	na	na	na	na	
arochlor 1260	220 ug/kg	830 ug/kg	na	na	na	na	
dieldrin	30 ug/kg	120 ug/kg	30 ug/kg	110 ug/kg	40 ug/kg	3900 ug/kg	1.5 ug/kg*
aldrin	29 ug/kg	110 ug/kg	29 ug/kg	100 ug/kg	38 ug/kg	2300 ug/kg	1.5 ug/kg*
toxaphene	440 ug/kg	1700 ug/kg	440 ug/kg	1600 ug/kg	580 ug/kg	na	
heptachlor	110 ug/kg	430 ug/kg	110 ug/kg	380 ug/kg	140 ug/kg	39,000 ug/kg	
chlrodane	1.6 mg/kg	7.2 mg/kg	1.6 mg/kg	6.5 mg/kg			18 mg/kg

KEY
higher than BL report
lower than BL report
In question

* Cleanup levels for aldrin/dieldrin are combined; sum of concentrations must be below 1.5 mg/kg

* Cleanup levels for aldrin/dieldrin are combined; sum of concentrations must be below 1.5 mg/kg

Data Samples Analysis: Map Showing Dieldrin at EPA Industrial Standards



Appendix B Building Demolition and Deconstruction Resources

The following section includes general construction and demolition resource links as well as descriptions of recycling operations located in closest proximity to Des Moines. Additional funding sources for building demolition and deconstruction may also be available through state agencies and private foundations.

Alter Trading Corporation is one of the largest ferrous and non-ferrous metal recyclers in the country. A trading office is located in Davenport, IA. A scrap metal processing facility is located in Des Moines. Contact 515-265-7377. www.altertrading.com

ConcreteNetwork.com offers links to concrete demolition contractors throughout the United States. www.concretenetwork.com/concrete/demolition/contacts/index2.html#IL

Iowa Department of Natural Resources (IDNR) offers a construction and demolition debris website with resources and information on C&D debris recycling, including information on the Solid Waste Alternatives Program (SWAP.) www.iowadnr.com/waste/recycling/cnd.html

Iowa Department of Natural Resources (Iowa DNR) offers a waste recycling directory designed to assist those interested in locating recycling opportunities for materials they have available. The directory also provides some information about recycling of each commodity listed. In some categories, contact names are provided if users have questions. www.iowadnr.com/waste/recycling/instructions.html

Omega Demolition uses specialized equipment processors and excavators to quickly remove hard to handle concrete and reinforcing steel. The concrete is crushed and recycled for onsite fill or offsite use, reducing transportation, handling, and disposal costs. Omega also works with customers to ensure savings through the sale of salvaged, used, decommissioned equipment and recyclables. Located in Elgin, IL, 304 miles from Des Moines. www.omega-demolition.com/Demolition.htm

OSWER Innovations Initiative: a program of EPA's Office of Solid Waste and Emergency Response (OSWER) which funds innovative pilot projects that demonstrate creative approaches to waste minimization, energy recovery, and recycling. This program encourages collaboration between EPA regional and headquarter program offices with co-regulators (i.e., Federal, State, interstate, intrastate, and local) and external stakeholders including public agencies and institutions, nonprofit private organizations, academia, and federally recognized Tribes. Contact Brigid Lowery at 202-566-0198 for more information.

Recycler's World includes links to recycling options for scrap iron and steel, wood, glass, and many other building elements. Links include online materials exchange programs that facilitate sale and exchange of goods, as well as information that assists users in locating the nearest recycling centers. www.recycle.net/recycle

Rock Hard Concrete Recycling provides concrete demolition, removal, and recycling services. Located in West Branch, IA, 122 miles from Des Moines. For more information, please reference: www.rockhardrecycling.com/index.htm

The Steel Recycling Institute has an online locator that identifies the nearest steel recycling facilities based on geographic information. According to the locator, Des Moines, IA has four steel recycling facilities. For more information, please reference: www.recycle-steel.org

For more information, please contact:

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